DOCUMENT RESUME

ED 059 868 SE 012 383

AUTHOR Gallagher, James Joseph
TITLE A Pre-Scientific Study of Interactions in Selected Science Classes.
INSTITUTION Educational Research Council of America, Cleveland, Ohio.
REPORT NO ERC-Pap-11
PUB DATE Feb 69
NOTE 9p.

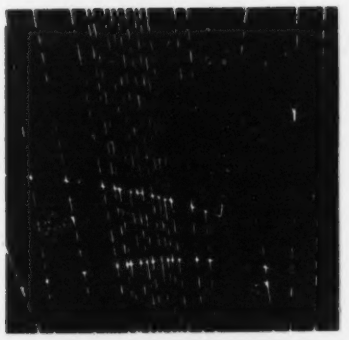
EDRS PRICE MF-$0.65 HC-$3.29
DESCRIPTORS *Behavior; *Discipline Problems; Individualized Instruction; *Interaction Process Analysis; *Misbehavior; *Secondary School Science; Student Behavior; Teacher Behavior

ABSTRACT

The author summarizes his observations of interactions in two classes of an individualized, self-paced, laboratory-based high school science course for students who normally do not take physics or chemistry. Based on these and other observations of classroom behavior of teachers and pupils the author postulates that two agendas are operative in classrooms. The primary agenda is that of the teacher and consists of the instructional program or formal curriculum. The secondary agenda consists of what the students have in mind. Generally students acquiesce by accepting the concerns of the teacher. However, in some situations students do not acquiesce but instead engage in a kind of guerilla warfare with their teachers. They perceive the primary agenda as irrelevant and attempt to sabotage it in many ways, such as not bringing books, pencils or paper to class, making jokes, and numerous other techniques. The phenomenon of guerilla warfare is considered to be widespread in all types of communities. A careful study of secondary agenda to determine its cause and prevention is recommended. (PR)

ED 059868

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY



A PRE-SCIENTIFIC STUDY OF INTERACTIONS IN SELECTED SCIENCE CLASSES

by
James Joseph Gallagher

EDUCATIONAL RESEARCH COUNCIL OF AMERICA
ERC PAPERS IN SCIENCE EDUCATION

SE 012 383

A PRE-SCIENTIFIC STUDY OF INTERACTIONS IN SELECTED SCIENCE CLASSES

by

James Joseph Gallagher
Research Associate

ERC Papers in Science Education
Number 11
February 1969

Based on an Invited Presentation at a Seminar on the Study of Interactions in Science Classes for the National Association for Research in Science Teaching, Pasadena, California, February 7, 1969. Draft – not to be quoted

ERC Papers in Science Education are prepared by members of the science staff, or by others through special invitation for the purpose of stimulating thought and discussion.

Most papers develop a position of the author(s) and do not necessarily reflect an official position of the ERC Science Program. It is probable that many papers will be superseded by formal published papers or by revised papers in this series.

THE SCIENCE PROGRAM
of the
Educational Research Council of America
Rockefeller Building, Cleveland, Ohio 44113

My present interest in observing interactions in science classes relates to a specific course being developed at the Educational Research Council. This course is essentially a laboratory course designed for those students who normally do not take physics and chemistry. The course is called SCIENCE PROBLEMS. It is an individualized, self-paced, laboratory approach to science where students, depending upon their interests, work in any of ten different topical areas. They are supposed to do experiments, write reports, take tests, in what might be called a guided inquiry approach. My general concern with this course is to find out what students do in this instructional setting where they are free to move at their own pace in an inquiry-oriented guided laboratory setting, and where they are free to choose the topic of inquiry. In addition, I also wanted to learn what teachers do in this setting--where their role is quite different from that of a typical classroom.

Existing observational instruments are somewhat inappropriate for the laboratory setting. The categories employed in these do not mesh with observed behaviors. Moreover, there is a need to look at more than just verbal behavior when studying interactions in the science laboratory.

Given these rather loose boundary conditions, I adopted the role of an anthropologist to try to ascertain what, in fact, goes on in the SCIENCE PROBLEMS classroom-laboratory setting, and what of all that goes on needs to be looked at

systematically. So, for the past two months, I've been, as David Hawkins called it, at the "messing about phase", trying to get a feel for the phenomenon that I am studying.

I've looked rather intensively at two classrooms. One of these, was in a Catholic high school in a community with a middle class population. The teacher in this setting was an experienced one, extremely confident of himself, his relationship with students, with parents, and with other teachers. The other classroom that I studied was in a public high school in an upper middle class community. The teacher in this classroom was in his first year of teaching and was worried about his relationship with students, parents, and other teachers. In both classes the population was comprised of a range of abilities from the dull-normal to very bright with the mean being slightly above average. The classes contained boys and girls who were generally below average in achievement. Low C and D students predominated.

What did I observe in these classes? In the class of the experienced teacher,students were engaged in a variety of activities prescribed by the course of study. Some were doing lab work, others were reading references, still others were writing reports, while some were taking tests. The teacher was relaxed. He interacted with students largely at their request. From time-to-time the teacher left the room for ten or fifteen minutes when he returned the class was going on as usual without any undue interruption of progress. In this class about 10 to 15 percent of the students were

trying to look busy without really working. I watched and listened to these students carefully. For the most part, they were engaged in extensive discussions usually in one of four major topics: cars, alcohol, girls, or how to avoid the draft.

The class of the inexperienced teacher was quite different. About 20 to 25 percent of the students were working on the prescribed activities. Another 20 to 25 percent of the students were openly "dogging it." Many were engaged in conversations on the same major topics: draft, girls, alcohol, and cars. Some were reading magazines like "Hot Rod" monthly.

The remaining 50 to 60 percent of the class precludes a simple description. One group of five boys was working on a topic called "Slotcars." A necessary piece of apparatus for study of Slotcars is a transformer. One day these boys neglected to put away the transformer as the class period ended. Another teacher found the transformer and locked it up and complained to the new SCIENCE PROBLEMS teacher. The next day when the students came into the class the transformer was not in the storage cabinet. The students asked the teacher about it, and after much bickering, the teacher indicated that they could not have the transformer because they had left it out. The students reacted with the approach; "no transformer, no work on Slotcars." So their work ground to a halt and this condition prevailed for several days.

Occasionally an outbreak occured; sometimes it was an argument, or a fight among the students. Often it was an argument with the teacher over equipment, written work, or

behavior. Usually these involved small groups, but sometimes the whole class was brought into the conflict. There was one incident where half a bottle of "Joy" was poured into the sink. It is a fairly simple matter to get rid of the detergent and it does not involve great property loss: You simply turn on the water slowly and let it run down the drain. But the teacher made much of this incident; he wanted the individual who caused it to own up to his guilt. When no one would admit it, the teacher brought all activity in the class to a halt. Students and teacher just sat for the greater part of a week. Finally, one of the students came to the teacher and admitted that he was guilty. The teacher told him to sit back down because he wasn't the guilty one, someone else had obviously done it.

Interactions between students and this beginning teacher were largely hostile and revealed suspicions that existed. One underachiever, with an IQ of more than 140, but with a history of D's and F's, earned an 87 on a test. The teacher would not honor this grade since, according to the teacher, this student had obviously cheated.

The influence of other teachers on this new teacher has been detrimental to the new teacher's attitude toward his students. Most of the students in this class were labeled by other teachers as "bananas." The application of this uncomplimentary title to this group of students is public knowledge. The students know that they are given this name; they know that they are considered the "bananas."

Enough of my descriptive data. What inferences can be drawn from these pre-scientific observations which were executed

as a way of generating questions for more precise study? These data, coupled with other observations of classroom behavior of teachers and pupils lead me to postulate that two agendas are operative in classrooms. The primary, recognized agenda is that of the teacher. This is the instructional program--the formal curriculum. It is the embodiment of the objectives that the teacher has in mind for the class. In SCIENCE PROBLEMS formal agenda entails doing experiments, writing reports, reading references, taking tests, etc. In a more traditional mode of instruction, in a chemistry class for example, it might involve a lecture-demonstration on equilibrium or a discussion of the differences between covalent and ionic bonding.

The secondary agenda consists of what the students have in mind for the class. Ideally, the students' objectives and those of the teacher are compatible. Probably it is more typical that students acquiesce by subordinating their concerns to those of the teacher. By and large, this is what students are expected to do in schools in our culture.

In some situations, such as those found in the "blackboard jungles" of the inner-city and in classes of underachievers (or "bananas") in suburban schools the secondary agenda comes to the fore. The students do not acquiesce. Instead they engage in a kind of guerrilla warfare with their teachers. They attempt to sabotage primary agenda which they perceive as irrelevant. They do this in many ways--some are subtle such as not bringing books, pencils or paper to class, or not putting away apparatus. Other more direct ways of sabotaging the primary agenda include activities such as interupting the class with hostile acts or

practical jokes directed toward the teacher or peers, or by simply leaving the room. Anyone who has spent time in the classroom, either as teacher or learner, could extend these lists. In the idealized setting the guerrilla warfare also goes on, but it is much less noticeable and usually is conducted outside of the class. Think of our own experiences as students: We had our favorite names for all our teachers, some of which were not complimentary, and we still laugh at some of our teachers' idiosyncracies. Moreover, there were times when we and our classmates sabotaged the primary agenda by getting a teacher to digress to his favorite, but totally irrelevant, topic.

When students' guerrilla tactics obstruct progress on the primary agenda, teachers retaliate by lowering grades, by establishing oppressive rules governing classroom behavior, and by undermining students' self-esteem with comments written on papers that returned, with spoken remarks and non-verbal behaviors which convey negative feelings. Teachers also retaliate by over-directing learning, by not allowing students the priveledge of acquiring their own meanings or of taking some responsibility for guiding their own learning.

Observations in schools in all types of communities--urban, suburban and rural, affluent and poor on either coast or in the midlands* leads me to believe that the phenomenon of guerrilla warfare is widespread. Although in classes of the so-called "good" teacher, students become engrossed in the

---

*These observations include my own and those of Philip Jackson, Jonathan Kozol, Peter Schrag and Douglas Roberts plus numerous teaching interns at the School of Education, Stanford University.

primary agenda and the secondary agenda of guerrilla warfare becomes irrelevant. In middle class schools more frequently the insurgency which characterizes the secondary agenda is crushed by the tactics employed by teachers. The co-workers of the new teacher in this case study, have become hard, insensitive people. By their behaviors they have helped to create the upper middle class dropout and yet they are unaware that they are contributing to the problem. In a state wide survey conducted by the Educational Research Council this past fall in Ohio, only 10% of the teachers felt that their behaviors influenced student behavior,and only 33% saw students as being capable as guiding some of their own learning.

What does all this have to do with the study of interaction? Most observers have focused on the primary agenda and they have assumed that the secondary one is merely inconsequential background. But in many classes, especially with the kinds of students that I have studied, the secondary agenda displaces the primary one. What we have considered background becomes the primary agenda and consumes the intellectual and physical energy of the participants. What is needed as a result of this preliminary anthropological study? It becomes evident that a careful study of the secondary agenda is needed--this background noise which can bring instruction to a halt. The guerrilla warfare between teachers and students is not confined to the culturely deprived areas of our cities. It is not just in the "blackboard jungle," it is widespread among students who have been turned off by our schools and it needs to be examined to determine its causes and its prevention.